

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference FIS920030339	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/US03/40295	International filing date (<i>day/month/year</i>) 18 December 2003 (18.12.2003)	(Earliest) Priority Date (<i>day/month/year</i>)
Applicant INTERNATIONAL BUSINESS MACHINES CORPORATION		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the Report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☒ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (See Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No. Figure 3

☐ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☒ because this figure better characterizes the invention.

☐ None of the figures

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/40295

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : H01L 27/108

US CL : 257/301, 752

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 257/301, 306, 752, 750, 753, 754, 758, 759, 760; 438/622, 623

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
NONE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
NONE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,335,598 B1 (Hsu et al.) 25 December 2001 (25.12.2001), fig. 24, column 7, lines 48-50, column 9 line 5, column 14 lines 15-55	1-9
A	US 2003/0211724 A1 (Haase) 13 November 2003 (13.11.2003), see entire document.	1-9
A	US 2003/0165418 A1 (Ajayan et al.) 04 September 2003 (04.09.2003), see entire document.	1-9
A	US 2003/0100189 A1 (Lee et al.) 29 May 2003 (29.05.2003), see entire document.	1-9
A	US 2003/0179559 A1 (Engelhardt et al.) 25 September 2003 (25.09.2003), see entire document.	1-9
A	US 6,599,808 B2 (Kim et al.) 29 July 2003 (29.07.2003), see entire document.	1-9
A	US 6,340,822 B1 (Brown et al.) 22 January 2002 (22.01.2002), see entire document.	1-9
A	US 6,286,226 B1 (Jin) 11 September 2001 (11.09.2001), see entire document.	1-9
A	US 2002/0163079 A1 (Awano) 07 November 2002 (07.11.2002), see entire document.	1-9

☒ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"B" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

Date of the actual completion of the international search

21 April 2004 (21.04.2004)

Name and mailing address of the ISA/US
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Date of mailing of the international search report

06 AUG 2004

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C. (Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 6,566,704 B2 (Choi et al.) 20 May 2003 (20.05.2003), see entire document.	1-9
A	US 6,548,313 B1 (Ravi et al.) 15 April 2003 (15.04.2003), see entire document.	1-9
A	US 2002/0167375 A1 (Hoppe et al.) 14 November 2002 (14.11.2002), see entire document.	1-9
A	US 2002/0125805 A1 (Hsu) 12 September 2002 (12.09.2002), see entire document.	1-9

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A	US 6,548,313 B1 (Ravi et al.) 15 April 2003 (15.04.2003), see entire document.	1-9
A	US 2002/0167375 A1 (Hoppe et al.) 14 November 2002 (14.11.2002), see entire document.	1-9
A	US 2002/0125808 A1 (Hsu) 12 September 2002 (12.09.2002), see entire document.	1-9